REMARKS

Claims 11 – 44 are pending in the present application. No claims have been amended, canceled or added, leaving Claims 11 – 44 for consideration upon entry of the present response. Applicants respectfully request a withdrawal of the rejection and an allowance of the claims based upon the following remarks.

Claims Rejected under 35 U.S.C. § 102

Claims 11- 16, 21, 22, 24 – 31 and 34 – 44 are rejected under 35 U.S.C. §102 (b) as being anticipated by U.S. Patent No. 5,532,217 to Silver et al. (Silver). (Office Action dated 10-03-08, page 2)

In making the rejection, the Examiner has stated that the claims are drawn to a bioactive glass composite comprising biocompatible polymer and a bioactive glass. (Office Action dated 10-03-08, page 2)

In making the rejection, the Examiner has further stated that

> [T]he '217 patent teaches a biological composite comprising mineralized fibers, bioactive glass materials and biocompatible polymers (abstract). The claims are drawn to a bioactive glass composite comprising biocompatible polymer and a bioactive glass. The '217 patent teaches a biological composite comprising mineralized fibers, bioactive glass materials and biocompatible polymers (abstract). The bioactive glass comprises a calcium and phosphate molecule (col. 2, lin. 40-49). The biocompatible polymers include gelatin, lanolin, or waxes (col. 2, lin. 50-53). The composite further comprises active agents such as hormones, enzymes and growth factors such as platelet-derived growth factors (col. 2, lin. 57-68). The material is used in bone repair therapies where the material is applied to treat bone defects (abstract, col. 2, lines 5-16). The fibers have the diameter from less than 1 micron to 500 microns (claims). The composite is formed in a method that includes mixing the calcium with phosphate, carrier compounds and extrusion at a temperature of 37 degrees Celsius (example). Regarding the composite at its ability to allow for the proliferation of stem cells, it is the position of the Examiner that these limitations are merely recitations of a future intended use.
> The claims recite that the "cells when seeded" will proliferate, meaning the composite is not yet seeded and as such any proliferation would be an inherent feature of the composite. The composite of the instant claims comprises a bioactive glass materials and biocompatible polymers, while the '217 patent teaches an identical composite. Since a compound and its properties cannot be separated, and the composite of the '217 patent is

identical to that of the instant claims, it is the position of the Examiner that the composite of the '217 patent would also proliferate any seeded cells.

(Office Action dated 10-03-08, page 2)

To anticipate a claim under 35 U.S.C. § 102, a single source must contain all of the elements of the claim. *Lewmar Marine Inc. v. Barient, Inc.*, 827 F.2d 744, 747, 3 U.S.P.Q.2d 1766, 1768 (Fed. Cir. 1987), *cert. denied*, 484 U.S. 1007 (1988).

Claim 11 as presently amended is directed to a bioactive glass composite, comprising a biocompatible polymer, a bioactive glass including at least one calcium, and at least one phosphorous molecular species; the biocompatible polymer being reacted with the bioactive glass.

Silver teaches the mineralization of collagen fibers whereby collagen fibers are contacted with a solution of calcium and phosphate ions under conditions to effect nucleation and in-vitro growth of mineral crystals within and on the surface of the collagen fibers to form intact collagen fibers with sub-fibrillar substructure. (see Abstract and see Col. 2, lines 29 - 39) Silver teaches that minerals containing calcium and phosphate are in the form of brushite or hydroxyapatite. (See Col. 2, lines 44 – 46)

In the first instance, it is submitted that the Examiner appears not to have noticed biocomposite of the claimed invention is one that is produced by reacting the biocompatible polymer with the bioactive glass. As noted above, Silver teaches the formation of crystals (from calcium ions and phosphate ions) that are embedded on the surface and within the fibrils of the collagen fibers. Silver does not teach that the biocompatible polymer is reacted with the bioactive glass. The Examiner has also not pointed out where Silver teaches that the biocompatible polymer is reacted with the bioactive glass.

For this reason at least, Silver does not teach all elements of the claimed invention. Since Silver does not teach all elements of the claimed invention, it cannot anticipate the claimed invention and the Applicants respectfully request a withdrawal of the § 102 rejection and the allowance of the claims.

Claims Rejected under 35 U.S.C. § 103

Claims 11 – 44 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combined disclosures of U.S. Patent No. 5,532,217 to Silver et al. (hereafter Silver) in view of U. S. Patent No. 5,711,960 to Shikinami (hereinafter Shikinami). (Office Action dated 10-03-08, page 4) The claims are drawn to a biocompatible composite comprising a biocompatible polymer, bioactive glass in the form of fibers that act as a scaffold. (Office Action dated 10-03-08, page 4)

In making the rejection, the Examiner has stated

> As discussed above the '217 patent discloses a biocompatible composite comprising bioactive glass and a biocompatible polymer, the reference however is silent to the spacing of the fibers and their proximity to each other. The orderly arrangement of the fibers is common in the art as shown in the '960 patent. The '960 patent discloses a biocompatible scaffold comprising a biocompatible polymer and bioactive glass on the surface of the fibers (abstract). The biocompatible polymers include polyethylene and poly-glycolic acid fibers (col. 10, lin. 50-61). With these things in mind it would have been obvious to arrange the fibers of the '217 patent as seen in the '960 patent in order to improve implant stability and compression properties for implantation. It would have been obvious to apply the fiber arrangement with an expected result of a stable implantable composite useful in bone repair treatments.

(Office Action dated 10-03-08, page 4)

As noted above, Silver does not teach that not teach that the biocompatible polymer is reacted with the bioactive glass. The Examiner has also not pointed out where Silver teaches that the biocompatible polymer is reacted with the bioactive glass. Silver does not teach all elements of the claimed invention.

Shikinami teaches an implant material which has high mechanical strength and durability in three-dimensional directions. (see Abstract) Shikinami teaches that the implant material functions to synchronize with the deformation characteristics of surrounding biological tissues and is capable of being penetrated by biological tissues into its fabric space. (see Abstract)

Shikinami teaches that the implant material uses as a base material, a

biocompatible bulk structure of a three-dimensionally woven or knitted fabric of organic fibers or a composite fabric thereof, and its void ratio in the fabric is preferably set to 20 to 90 vol%. (see Abstract) The base material comprises a biocompatible bulk structure of a tri-axial or more three-dimensionally woven fabric of organic fibers, a tri-axial or more three-dimensionally knitted fabric of organic fibers or a combination thereof. (see Claim 1)

Shikinami in its Examples teaches the manufacturing of this three-dimensional woven fabric. Shikinami in Col. 7, line 25 through Col. 8, line 27 teaches how to manufacture a glass coated yarn. Only relevant portions of the disclosure of Shikinami are disclosed below to point out the differences between Shikinami and the claimed invention.

In its Example 1, Shikinami teaches that a high density polyethylene (HDPE) yarn of 50 denier filaments is coated with linear low-density polyethylene (LLDPE) (melted at 120°C), which is then subjected to a plasma treatment. (See Col. 17, lines 25 – 67) Following the plasma treatment, the yarn is subjected to treatment in a phosphate solution and a calcium containing solution to produce a thin layer of calcium phosphate on the yarn. (See Col. 18, lines 1 – 7) The yarn is then used to produce a three-dimensional weave of a block shaped orthogonal fabric. (See Col. 18, lines 8 – 20) The weave is then placed in a mold and pressurized following which it is coated with a fine particle powder of AW glass. (See Col. 18, lines 21 – 27)

Shikinami thus teaches manufacturing a weave from a yarn having a layer of calcium phosphate disposed on it with a layer of glass particles disposed upon the surface of the weave. Shikinami does not teach reacting a bioactive glass with a bioactive polymer; where the bioactive glass comprises calcium and phosphorus. The glass disclosed by Shikinami does not contain calcium or phosphorus. Additionally, the glass is not reacted with the polymer used in the yarn. For these reasons at least, Shikinami, like Silver, does not teach all elements of the claimed invention.

Thus, Silver even when combined with Shikinami would not produce the claimed invention. Since neither Silver nor Shikinami teach all element of the claimed invention, there is no motivation to combine Silver with Shikinami.

In summary, the Applicants believe that the Examiner has not made a prima facie

case of obviousness over Silver when combined with Shikinami. The Applicants therefore respectfully request a withdrawal of the obviousness rejection over Silver in view of Shikinami.

It is believed that the foregoing amendments and remarks fully comply with the Office Action and that the claims herein should now be allowable to Applicants. Accordingly, reconsideration and allowance is requested.

If there are any additional charges with respect to this Amendment or otherwise, please charge them to Deposit Account No. 06-1130 maintained by Assignee.

Respectfully submitted,

CANTOR COLBURN LLP
Applicants' Attorneys

By: /David E. Rodrigues/
David E. Rodrigues
Registration No. 50,604

Date: October 27, 2008
Cantor Colburn LLP
20 Church Street, 22nd Floor
Hartford, CT 06103
Customer No.: 23413
Telephone: (860) 286-2929